

Employment and income generating activities derived from Internet Access

Presented
By Georges Hénault

To : Renald Lafond
Senior Program Specialist
Information and Communications Technologies
Program Branch
IDRC

September 1996

TABLE OF CONTENTS

INTRODUCTION	3
METHODOLOGY	3
STRUCTURE OF THE REPORT	4
THE PARADOX OF CREATIVE DESTRUCTION: THE ISSUE OF THE INFORMATION HIGHWAY AND ITS IMPACT ON EMPLOYMENT	6
A methodological challenge	7
Leapfrogging: a must?	8
Some key public policy issues	9
INTERNET NETWORKS FOR COMMUNITY DEVELOPMENT	12
Community Information Centres	12
Network enterprises and networks of enterprises	13
Conditions for success	13
IDENTIFICATION OF SOME PROJECTS/CASE STUDIES/INITIATIVES	15
CONCLUDING REMARKS	18
BIBLIOGRAPHY	19
APPENDIX 1	25

INTRODUCTION

The Internet offers a huge range of employment opportunities. New forms of information intensive enterprises are being created, such as data entry and processing companies, as well as software development and online selling ones. Such businesses could potentially be established in small and remote communities since the new information technologies can be used on a decentralized basis.

As part of IDRC's major initiative on the use of Information and Communication Technologies (ICT's) at the community level in sub-Saharan Africa, the terms of reference (see appendix 1) of this study can be summarized as follows:

- ▶ Conduct a literature review using the Internet, various data bases, and personal contacts to identify different types of employment and income generating opportunities provided by the availability of ICT.
- ▶ Identify projects and cases studies that have been conducted in both developed and developing countries.
- ▶ Identify institutions, researchers and consultants that are studying this topic as well as any public policy, relevant information system, networks or tools that are available electronically.

METHODOLOGY

This study has been conducted through Intensive search on the Internet. This new research tool does provide access to a wide variety of sources scattered all over the world. However, it requires a lot of effort, time and patience. Many URL addresses become quickly obsolete as new and improved versions of browsers are made available. Furthermore, unless sites are regularly maintained and updated, some information may not be as relevant as it would if personal contact was made with the

organization.

The more traditional library and CD-Rom search that has been conducted for this study has identified useful sources of more in depth information, but it lacks the attractiveness of some new and very recent data that one can get on the net. Obviously, the area of study is so new that there is a limited number of research endeavours that have been made public and/or published.

It is too early, on a pure methodological basis, to conduct an impact study on the role of Internet on our societies, since most projects are in their stage of infancy. Therefore, we will assume that the Information Highway will have a similar, although idiosyncratic, role in the changing patterns of our economic behaviour and systems just as the telecommunications industry did. That is why the analogy between these two fields of study will be used in this report in order to get a proxy of the a priori impact of Internet on SME's and community development.

STRUCTURE OF THE REPORT

The main objective of this report evolves around an attempt to synthetise the information obtained through the net and the Library on the impact of the Information Highway on income generation and employment as well as on the networks of Small and Medium Enterprises (SME's) that may revitalize community development.

The first part of the report will deal with the paradox of creative destruction of jobs induced by the new information technology revolution. Even if the a priori impact seems to be globally positive, the methodology challenge to evaluate it has not yet been met. There seems to be a consensus, however, on the fact that the leapfrogging approach should be privileged and that some key policy issues have to be addressed if one wants to benefit from the ICT revolution.

The second part of the report looks into the meso and micro dimensions of the employment/Internet interface in the context of community development. Two new types of organization have emerged and are encouraged for that purpose: the community information centres and the network enterprise. They will be described briefly along with their conditions for success.

The third part will identify a few projects that are planning to or implementing these new policies and concepts.

THE PARADOX OF CREATIVE DESTRUCTION: THE ISSUE OF THE INFORMATION HIGHWAY AND ITS IMPACT ON EMPLOYMENT

Extensive studies by the OECD (1994), along with a vast specialized literature on the matter, estimate that the information highway development and use should have a positive impact on employment, based on numerous assessments of the historical effect of telecommunications and information technologies (IT) development and applications. Technological change both destroys and create jobs. Examples from Canada, Europe and the United States illustrate the positive side of these changes.

- ▶ In Canada, employment gains may be expected in the following areas (Potter and Lee, 1995):

- Building infrastructure (484000 Canadian jobs in 1993).

- Content development in the leisure, education and training , health care areas (13000 innovative software firms in Canada).

- Users of the Information Highway, with an increasing demand for IT workers, as well as an increase of knowledge intensity of all jobs.

- ▶ On the European front, "Teleworking is emerging as a major social phenomenon ... the information society creates new service markets, speed up administrative decision making procedures" (Commission of the European Community, 1993).
- ▶ In the United States, over 8 millions new jobs have been created between 1993 and 1996, of which 60 percent are in professional and technical occupations, thus upgrading the overall occupational profile (Castells, 1996b). It is not a problem of massive unemployment but of selected unemployment (Castell, 1996c).

Serious difficulties arise when a more precise impact measure is required. There does not seem to be a consensus on the validity of the methodology used to evaluate the causality links between Internet and employment.

A methodological challenge

There is little evidence to suggest that the new information technology creates jobs on a massive scale (OECD, 1994). It can be argued that there is little serious analysis and no established methodology of the relationship between telecommunication services and economic performance.

On the occasion of the 1995 symposium on information infrastructure (Mahan and Murray, 1995), the importance of demand for future development was raised as was an absence of evidence for identifying it... At the micro level, there is still a lack of understanding as to where and when -much less why- information technology can be applied by small to medium size enterprises to successfully achieve full job growth, trade, and build clusters of innovation which may not be cyber spatially based. Causality links from the information infrastructure to economic development has been relatively ignored by economists and policy makers. We don't know how to really measure productivity linked to technology in advanced services. (Castells, 1996c). Two econometric studies, Cronin and alia, and Capello have arrived at not necessarily converging conclusions when they both deal with this causality link. Their respective methodology appears to be sophisticated, complex and incomplete. No definite conclusion can therefore be established.

Cronin and ali, (1995), have studied the rural economic development implications of telecommunications in Pennsylvania. They note that economic development, as measured by both job growth and income, has proceeded at a much slower pace in rural areas than in urban areas of the United States, because of fewer economies of scale, less access to health and education facilities and less access to information and technology. Because the telecommunications service is a ubiquitous input used in the production of every good and service in the economy, enhancement to telecommunications infrastructure has the potential to alleviate many rural problems.

Capello (1994) has assessed the success of the Special Telecommunication action for Regional Development (STAR) program of the European Community in Southern Italy. It was established to "encourage economic development in the less favoured regions of the Community by means of easier and quicker access to advanced telecommunications technologies." Based on a variety of statistical analyses, Capello reaches a conclusion that may not be welcome to supporters of revitalizing regions through advanced telecommunications. "Although this programme has achieved the aim of stimulating a local demand for advanced telecommunications networks and services, it has hardly generated any significant regional performance. Firms located in the south do not show an improvement in their business performance related to the adoption of new telecommunications technologies."

Leapfrogging: a must?

Major international organizations seem to back up the idea that developing countries must adapt quickly in order to integrate the potential of Internet in their economic objectives and systems. For example, the ITU in its 1995 World Telecommunications Development Report (WTDR) argues that "Developing countries cannot afford to wait and see what happens. Installation of information infrastructure in remote and rural areas could reduce the pressure towards urbanization.... the availability of IT will help to attract and retain skilled manpower."

The World Bank reinforces this point of view. "Countries which are able to seize the opportunities these technologies present will be able to leapfrog into the future, even though they lack a developed communications infrastructure today. In fact, countries with little existing communications infrastructure, with less need to deal with vested interests in old technologies, can proceed directly to the use of wireless technologies and fibre. The key will be visionary leadership and the ability to mobilize nations around an attractive and realisable vision of their citizens' future" (Knight and Boostrom, 1995).

The OECD, (Antonelli, 1991) however, has underlined a set of additional necessary but not sufficient conditions. «Les perspectives de rattrapage technologiques et de diffusion rapide des télécommunications de pointe semblent particulièrement favorables dans les pays :

- ▶ Qui ont une économie de dimension modeste.
- ▶ Qui sont très ouverts au commerce international et aux investissements étrangers.
- ▶ Dont la demande de nouvelles technologies s'est développée à partir de la fin des années soixante dix.
- ▶ Dont l'infrastructure de télécommunication pré-existante est peu développée.
- ▶ Qui ont une certaine liberté de manoeuvre pour remodeler les relations verticales entre les fournisseurs locaux d'équipements de télécommunication et les acheteurs au lieu de dépendre pour les approvisionnements de filiales d'entreprises étrangères bien implantées dans le pays.»

Some key public policy issues

The following list of public policy issues vis à vis employment, Internet, community development and the role of SME's cannot be exhaustive. It is a synthesis of the most pressing and relevant problems that have to be solved in order to implement a comprehensive approach to meet this challenge based on the results of the search done in the context of this study.

a) The management of the transition period.

As already mentioned, in the long run, information technology should create more jobs than destroy them. There is, however, a very real concern about a proacted time lag between the cycles of job destruction and job creation (Gilroy, 1995). The key policy challenge is to boost productivity and growth through increased knowledge intensive economic activities while maintaining social cohesion (OECD, 1996). The ILO endorses this perception since the key to success is to adjust more quickly in order to minimize the period of transition (Potter and Lee , 1995).

The Information Society and Development Conference (1996) confirms the need to ensure that Labour benefits from the global infrastructure society (GIS) through extensive training, retraining and life-long learning of all workers.

b) The need for an integrated approach.

It has been argued for a long time that development challenges can be met if and only if a systemic approach is put in place. This must apply, obviously, to the implementation of a comprehensive Internet policy into the overall development objectives.

The green paper of the European Commission on "Living and working in the information society " (1996) mentions the need to ensure that SME's take full advantage of the information society through an integrated approach to ICT; it should offer enormous potential for firms to become more competitive since the whole concept is built on the small unit, is market driven, based on team working and decentralized. Such a vision should take into consideration, among other things, the taxation policy of telecommunication imports as well as training programs that anticipate skill needs. For example, the Kenya Government has just reduced its import tax on computer hardware from 200% to 10%, but it refused to allow private satellites for telephone communications (Africa Communications, 1996).

c) An emphasis on organisational, political and cultural dimensions rather than on technical and financial issues.

The World Bank strongly believes that the real challenge is not technical or financial, but organisational and political....While there are no territorial barriers to rapid expansion of Internet service in Africa, there are many in the sphere of obsolete regulatory frameworks that results in constricting barriers to information access and knowledge expansion. (Knight and Boostrom, 1995).

The controlling attitudes of former monopolistic Post and Telephone State Organisations illustrate this political as well as cultural approach to public governance (i.e. the Kenyan case cited above). The already mentioned Symposium on information infrastructure notes in a euphemistic way that cultural differences were raised as central, not ancillary, to any discussion of the Global Information Infrastructure. (Mahan and Murray, 1995).

The development of content is of a major significance (Information Society and Development Conference, 1996). This preoccupation is echoed in *Le Monde Diplomatique* when it states :«Bien au delà de l'accès à l'information, l'enjeu majeur est la production des données et la maîtrise des contenus.(Renaud et Torres, 1996).»

INTERNET NETWORKS FOR COMMUNITY DEVELOPMENT

NGO's Internet related networks such as Green-net and Healthnet are very active players in the decentralization of the benefits the Information Highway can bring to the remote areas of some African countries. In Kenya, for example, 30% of the above mentioned networks subscribers are in the rural areas, (Africa-communications, 1996). The key organisational challenge is to foster a culture of strategic alliances between all the actors, SME's, multinational corporations, NGO's, government institutions as well as international organizations, involved in the development field. That is what is presently happening. Let us have a quick look at two new organizational forms that are emerging as key players: Community Information Centres (CIC) and network enterprises.

Community Information Centres

Drucker (1994), among others, claims that developing countries can no longer expect to base their development on their comparative labour advantage. What counts now is the application of Knowledge. Community Information centres are a multi sectoral concept that can provide people, NGO's and businesses in poor rural and urban areas with economic, easy and ready access to needed information.

The centres should be a powerful engine of rural development...they could be hubs, at the community level, through which a large number of information services can be dispensed such as telephone, fax, local bulletin, documentation searches on demand, video libraries for entertainment and education, health and nutrition training, government services, market prices, self paced learning and more (Talero and Gaudette, 1996). A community-based information technology project in Nebraska, described in part III, has used a similar concept when Information Technology Committees have been set up to achieve the goal of benefiting from IT (Hoy, 1995).

The centres should be multi-sectoral facilities and eventually self sustaining through fees and contracts. The question of business needs of SME's and the supply of the relevant information remains to be answered (Hénault, Lafond et Melesse, 1996). The World Bank is presently exploring the idea of CIC through a study being undertaken by VITA.

Network enterprises and networks of enterprises

Small companies work through networks connecting small companies (Castells, 1996c). The network itself becomes an independent entity called the network enterprise. This concept is not that new in itself since export consortia, that have been in existence for over twenty years, can be considered as network enterprises. The Scottish Internet Business Association, acting as a virtual trade body, is another good example (described in part III). The network of enterprises would be synonymous with the strategic alliance one. Whatever the form of regrouping, it should enhance, but not under any circumstances, the capacities of SME's to innovate and define more global strategies. An information network among firms is similar to a partial merger; firms achieve economic symbiosis or synergies from sharing information with other firms to which they are connected.... Information sharing networks improve overall performance but also reduce private monopolistic control of information: they play a similar role to the removal of trade barriers in increasing both efficiency and competition (Capello, 1994).

Conditions for success

In order to implement a successful strategy to promote an efficient use of the Internet to create jobs through SME's at the community development level, one should take into account the following considerations:

- ▶ Based on a study on telecommunications and rural development in the United States (Schmandt, 1991), the key to success was the presence of visionary community leaders with time and energy.

- ▶ Success also depends on the availability of qualified individuals.
- ▶ Within a given community there is a hierarchy of telecommunication needs : those at the top (business and community leaders) need access to more advanced telecommunication resources (such as electronic databases and teleconferencing) than those at the lower levels (the community at large).
- ▶ Community development is a communication process, intensive process aimed at increasing interaction within the community. Alliance forming and resources sharing have to be the basis of the community betterment. Telecommunications can either enhance or hinder the process of interaction.

The cultural aspect of the information control becomes then the key to community development through the access to the information highway. Some tend to keep the information they get through Internet as a means to increase their power on the community; others tend to share it. (Gopnik, 1996). Another dimension is the use of computers as a cultural capital (Castells, 1996c). The main issue is not that you have a computer but that you know what to do with the computer. This is cultural ability transmitted by the school, the family and the interaction between the school and the family.

Internet is therefore a necessary but not sufficient condition for rural community development since without indispensable physical and human infrastructure (Human capital, education, roads, health care etc.,) no policy can survive.

IDENTIFICATION OF SOME PROJECTS/CASE STUDIES/INITIATIVES

The following list of projects and /or initiatives that can be used as case studies have been identified during the research done for this study. It excludes the projects with which IDRC is presently involved such as the Information for Development program (infodev) monitored by the World Bank, those managed by the UNCSTD or UNCTAD.

- ▶ The Appalachian Centre for Economic Networks (ACEnet) enables community based micro enterprises and small business assistance programs to increase their effectiveness through the use of the Internet. This project consists of three complementary strategies. It uses the Internet to link micro firms with high-value markets, to create networks of firms and service providers within communities, and to enable community-based micro enterprise programs around the United States to work collaboratively and learn from one another's experiences (Borgstrom and Holley, 1996).

One of the most important services provided by this project is access to a continual stream of market intelligence information system, and market locations that can be used to help firms find customers and develop new products.

- ▶ The G7 : Global Marketplace for SMEs (Martin and Guérette, 1996) should enable SMEs to access information needed to integrate themselves into the fabric of global trade. This project jointly led by the United States, Japan and the EC, has three major themes : Global Information Network for SMEs, SME Requirements and Testbeds for EDI/Electronic Commerce.

The approach is to contribute to the development of a global electronic environment for the open and non-discriminatory exchange of information and to expand electronic commerce on a global scale to the benefit of SMEs. The project will aim to give the global interoperability of services necessary for a global marketplace.

- ▶ Le centre d'initiative technologique de Montréal (CITEC). Créé en 1987 par les dirigeants des secteurs privé et académique, ce réseau universités-gouvernements-entreprises est censé stimuler la création d'emploi dans les secteurs scientifiques et technologiques de pointe de la région de Montréal, tels que la biotechnologie, l'aérospatiale, l'électronique et les technologies de l'information. Le CITEC est relié à l'AURRP (Association of University Related Research Parks).
- ▶ L'exemple Burkinabé (Renaud et Torres, 1996). Ce projet commencé en juin 1989 à l'initiative de l'Orstom à Ouagadougou regroupe désormais une trentaine d'organismes dont plusieurs organisations internationales (la FAO et la Banque mondiale notamment), l'école supérieure d'informatique (ESI), et plusieurs ONG. Il représente ce que nous avons appelé précédemment un Centre d'information Communautaire (CIC) qui relie par Internet l'ensemble de ses partenaires entre eux et avec le monde.
- ▶ Nebraskas Global Community Initiative (Hoy, 1995). In the Spring of 93, the Nebraska Department of Economic Development began a project the goal of which was to motivate fifty rural communities to set up Information Technology Committees. The following barriers to effective deployment and utilization of information technology and telecommunications in rural areas have been identified as follows : awareness about Information Age was almost inexistent among the citizens of rural Nebraska, the access to the Internet and other value-added databases was not available, the cost of the use of new technologies was perceived as very high, and finally many adults were suffering from technophobia.

The Partnering between important sectors such as health, education, small businesses and local government) has proven to be the main ingredient of this project. However, no significant impact is mentionned in Hoy's paper.

- ▶ The Scottish Internet Business Association (Collie and Howell, 1996) is an interesting example of what we called earlier a network enterprise. It was created during the second half of 1994. It has now about 150 members ranging from companies, universities departments and governments agencies. The specific aims of SIBA are to promote the use, by busines in Scotland, of the Internet; to share information about developments in the Internet industry; to share technology and contacts where appropriate and to establish, administer and maintain a code of practice for members.

The lessons of this apparent success are based on the drive and initiative of a relatively small number of dedicated individuals and on the provision of services such as e-mail and newsgroups that allow members to increase their opportunity for knowledge transfer.

- ▶ The European Commission's New Integrated Program for SMEs (Green Paper, 1996). The objectives of this pilot action, that will be launched soon, is to ascertain the priorities of SMEs and the obstacles hampering the use by SMEs of information technologies.

CONCLUDING REMARKS

The notion of community has been at the heart of Internet since its inception (Armstrong and Hagel, 1996). In this *Harvard Business Review* article, the authors argue that in the long run electronic communities are likely to create value in four different ways. First, communities can charge usage fees. Second, they can charge users content fees for downloading specific information. Third, they can draw revenues from transactions and advertising and finally, some electronic communities may be in a position to take advantage of synergies with other stakeholders.

The virtually electronic community of SMEs can therefore contribute to create not only building capabilities but also economic value that would stimulate community development through the efficient use of Internet.

BIBLIOGRAPHY

Africa-Communications: Information Superhypeway or Highway? (1996) Inter Press English News Wire, 04-12, 3p.

Antonelli, C. (1991). La diffusion des télécommunications de pointe dans les pays en développement. Paris, OCDE, 117 p.

Armstrong, A. And Hagel J. (1996), "The Real Value of On-Line Communities", Harvard Business Review, vol. 74, no. 3, pp. 134-141.

Berben C. and Clements, B. (1995), "The European Framework for Competition in Telecommunication: The Benefits for Peripheral Countries", Telecommunications Policy, vol. 19, No. 4, pp. 273-284.

Borgstrom, A. and Holley J. (1996), "Using the Internet to Amplify and Support Microenterprise Development", Montréal, INET 96, 1p.

Breton T. (1994), Les téléservices en France : Quels marchés pour les autoroutes de l'information? Paris, La documentation française.

Capello, R. (1994), Spatial Economic Analysis of Telecommunications Network Externalities, Aldershot (UK), Ashgate Avebury.

Carnoy, M. and Castells M., Sustainable Flexibility. Work, Community in the Information Age, 1995, Berkeley, University of California, Center for Western European Studies.

Castells, M. (1996a), The Information Age: Economy, Society and Culture - Vol. I: The Rise of the Network Society, Oxford, Blackwell.

Castells, M. (1996b), The New Business World: Networks and Firms. The ILO Enterprise Forum, Geneva, 8-9 Nov., 5 p.

Castells, M. (1996c), "Relationships of Advanced Information Technology, Economic Organization, and the Social Structure of Cities", M.I.T. Colloquium on Advanced Information Technology, Low-Income Communities, and the City, March 1996, 15 p.

Clough, M. (1996), "Cyberspace: Why Nations Could Fear the Internet", Los Angeles Times, 02-04.

Collie, G. (1996), "The Scottish Internet Business Association as a Virtual Trade Body", Montréal, INET 96, 7. p.

Communications Outlook, 1995, Paris, OECD, 300 p.

Conference Board of Canada (1994), Jobs in the Knowledge-Based Economy: Information Technology and the Impact on Employment, Ottawa.

Cronin, F. (1995), McGovern, P., Miller, M. and Parker, E. (1995), "The Rural Economic Development Implications of Telecommunications: Evidence from Pennsylvania". Telecommunications Policy, Vol. 19, No. 7, pp. 545-559.

Drucker, P. (1993), Post-Capitalist Society, New York, Harper Collins.

Drucker, P. (1994), "The Age of Social Transformation", The Atlantic Monthly, Nov. 94.

Dufour, A. (1995), Internet, Paris, P.U.F., Collection "Que sais-je?", 126 p.

French, J. (1995), "Internet uncharted in African Nations", Globe and Mail, Nov.21.

Gopnik, A. (1996), "The Virtual Bishop", The New Yorker, March 18, pp. 59-63.

Goss Gilroy Inc. (1995), "Impact of the Information Highway on Employment and the Workplace". A special study for the challenge of the information highway: final report of the information highway advisory council1, 139 p.

Green Paper Living and Working in the Information Society: People first (1996), Brussels, European Commission, 28p.

Growth, Competitiveness, Employment: The Challenges and Ways Forward Into the 21st Century (1993), Brussels, EGSC-EFC-EAEC; Commission of the European Communities White Paper, 151 p.

Hénault, G., Lafond, R., et Melesse, M. (1996), "L'information comme marché", in La création d'entreprise en Afrique, sous la direction de Albagli, C. et Hénault, G., Paris, EDICEF, pp. 143-152

Hénault, G., Large, D., Laurent, P. et Paquet, G. (1996), "L'autoroute de l'information et le marketing international", Revue française de marketing, No. 156/1, p. 13-22.

Hoy, C. (1995), "Blueprint for a Rural Renaissance Community-Based Information Technology Planning", <http://neon.nic.state.ne.us>, 12 p.

Information Society and Development Conference Theme Paper (1996), Gallagher Estate, Midrand, South Africa (13-5-May), 18 p.

Information Technology Outlook, 1995, Paris, OECD, 198 p.

Kapur, P., "Internet Competitive Advantage and the Global Economy", Montréal, INET 96, 1 p.

Knight, P. (1995), "The Telematics Revolution in Africa and the World Bank Group", Symposium on Information Superhighways: What Strategy for Africa", 9 p.

Knight, P. and Boostrom, E. (1995), "Increasing Internet Connectivity in Sub-Saharan Africa: Issues, Options, and World Bank Group Role", Online World Bank Publications, 21 p.

Maddison, A. (1989), The World Economy in the 20th Century, Paris, OECD, 146 p.

Mahan, A. and Murray, C., Eds, 1995, Proceedings of the Symposium on the Information Infrastructure: Building the Foundation for the 21st Century. Vancouver, Asia Pacific Foundation and Industry Canada, 128 p.

Martin, P. and Guerette, J. (1996), "Projets-pilotes du G7", Stratégis. Industrie Canada, 19 p.

Mody, B. and Bauer, J., Eds., (1996) Politics: Ownership and Control of the Information Highway in Developing Countries. Laurence Elbaum Publisher, LEA Telecom Series.

Moussa, A. and Schwabe, R. (1992), "Informatics in Africa: Lessons from World Bank Experience", World Development, Vol. 20, No. 12.

Negoronte, N., (1995) Being digital, New York, Knopff.

OECD Employment Outlook (1996): The OECD Jobs Strategy: Technology, Productivity, and Jobs Creation, Paris, OECD, 260 p.

Piore, M.J., (1996) "Job generation by Micro, Small and Medium-Sized Enterprises, The ILO Enterprise Forum, Geneva, 8-9 Nov., 7 p.

Potter, M. and Lee, M. (1995), "The Economic Impacts of the Information Highway: An Overview", Discussion Paper for the task force on growth, employment and competitiveness information highway advisory council, Ottawa, 24 p.

Rapport final du Comité consultatif sur l'autoroute de l'information (1995), Le défi de l'autoroute de l'information, Ottawa, Gouvernement du Canada, 292 p.

Renaud, P. et Torres, A. (1996), "Internet, une chance pour le Sud", Le monde diplomatique, Février, 6 p.

Saunders, R., Warford, J. and Wellenius, B., Telecommunications and Economic Development, 2nd Edition, Baltimore, John Hopkins, University Press.

Schmandt, J., Williams F., Wilson R. and Stroker S., Eds (1991), Telecommunications and Rural Development: a Study in Private and Public Sector Innovation, New York, Praeger, 262 p.

- Skrzeszewski, S. and Cubberley, M. (1996), "A New Vision of Community and Economic Development: A Multidimensional Convergence of Government, Business, and the Social Sectors with the Internet", Montréal, INET 96, 9 p.
- Sirois, C. et Forget, C. (1995). The Medium and the Muse: Culture, Telecommunications and the Information Highway, Montréal, The Institute for Research on Public Policy, 112 p.
- Talero, E. and Gaudette, P. (1996), Harnessing Information for Development: A Proposal for a World Bank Group Vision and Strategy. On Line World Bank Publication.
- Tapscott, D. (1995), "Leadership Needed in Age of Networked Intelligence", Boston Business Journal, Vol. 11, No. 24, pp. 15.
- Tapscott, D. (1996), Digital Economy: Promise and Peril in the Age of Networked Intelligence, Toronto, McGraw-Hill.
- Thery, G. (1994), Les autoroutes de l'information: Rapport au Premier Ministre, Paris: La documentation française, 127 p.
- Wackernagel, M. (1996), "Universal Connectivity for Africa?", Africa News Service, 3 p.
- World Telecommunications Development Report (1995), Geneva, ITU.

APPENDIX 1

APPENDIX 1

Employment and income generating activities derived from Internet Access

Terms of references:

The Internet serves as an efficient and cost-effective global communications facility and is now changing the way business, governments and organisations communicate within their organisations and with their customers and suppliers. The Internet is becoming an increasingly important vehicle, resource and tool for electronic commerce. It offers a huge range of new business and commercial opportunities creating employment opportunities such as the establishment of Internet Service Providers (ISP), the development web sites, the production of software related to the Internet, the expansion of information-intensive industries such as data entry and processing, software development, and online selling and retailing. One of the impacts of the development and use of communication technologies such as the Internet is that such businesses can potentially be established in small and remote communities and be decentralized. The globalization of markets, the more generalized use of tele-working, as well as lower wages may present communities in developing countries with new employment and income opportunities.

IDRC is developing a major initiative on the use of Information and Communication Technologies (ICTs) at the community level in sub-Saharan Africa which will cover five priority sectors, one of which is employment and income-generating activities. A report on the impact, the benefits and limitations of ICT and in particular of the Internet, is needed as background for the development this initiative.

In this consultancy contract, you will be expected to:

- Conduct a literature review using the Internet, various databases and personal contacts to identify different types of employment and income generating opportunities provided by the availability of ICT, and collect documentation that describes such opportunities.
- Identify projects and cases studies that have been conducted in both developed and developing countries. Gather information on key planned initiatives and identify the main actors. The report should indicate the relative importance of the main categories of actors, i.e. what is the relative importance of public and private sectors and what is the role of civil society? One-page summaries of several case studies summarizing the successful use of ICT to solve development problems in the sector should be prepared. Some case studies could deal with particular groups such as women, disabled people, native communities, etc.
- Identify institutions, researchers and consultants that are studying the impact of information technologies, particularly the impact of connectivity on employment and income opportunities.
- Identify any public policy issues that might influence the development of this sector;
- Identify relevant information systems, networks, or tools that are available electronically in this sector.
- Prepare a brief report outlining the key issues for IDRC by August 30, 1996 and a full comprehensive report, of 20- 30 pages, by September 30, 1996. The reader generally familiar with ICT, but unfamiliar with developments in this sector.